

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 13 FEB 2006

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Applicant's or agent's file reference A4-254PCT		<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/US2004/039084		International filing date (day/month/year) 19.11.2004		Priority date (day/month/year) 20.11.2003
International Patent Classification (IPC) or national classification and IPC H05K7/10, H01R13/24				
Applicant MOLEX INCORPORATED et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 11 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  17.06.2005		Date of completion of this report  10.02.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Kardinal, I  Telephone No. +49 89 2399-7191		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/039084

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-6 as originally filed

**Claims, Numbers**

1-6, 8, 9, 11, 13, 14 as amended (together with any statement) under Art. 19 PCT

**Drawings, Sheets**

1/3-3/3 received on 20.01.2005 with letter of 20.01.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/039084

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-6,8,9,11,13,14
Inventive step (IS)	Yes: Claims	
	No: Claims	1-6,8,9,11,13,14
Industrial applicability (IA)	Yes: Claims	1-6,8,9,11,13,14
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item V.**

**1. Reference is made to the following documents:**

- D1 :** US 2001/023140 A1 (SAIJO TAKASHI ET AL) 20 September 2001 (2001-09-20)  
**D2 :** PATENT ABSTRACTS OF JAPAN, vol. 1998, no. 13, 30 November 1998 (1998-11-30); JP 10 214649 A (YOKOWO CO LTD), 11 August 1998 (1998-08-11)  
**D3:** PATENT ABSTRACTS OF JAPAN vol. 2000, no. 25, 12 April 2001 (2001-04-12) -& JP 2001 208793 A (NEC YAMAGUCHI LTD), 3 August 2001 (2001-08-03)  
**D4:** EP-A-1 172 658 (INTERCONNECT DEVICES INC) 16 January 2002 (2002-01-16)

**2. INDEPENDENT CLAIM 1**

Claim 1 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claim seeks to define the invention by reference to features of the use to which the apparatus or product is to be put. This is particularly the case as claim 1 not only defines the product itself, i.e. "an electrical terminal", but also specifies its relationship to a second product, i.e. "a first electrical device having a mounting cavity with one open end" which is not part of the claimed invention. Such a claim must either set forth a clear definition of the individual product being claimed by wording the claims appropriately, or be directed to a combination of the first and second products.

Thus, the subject-matter of present claim 1 commencing with the wording "An electrical terminal for mounting in a mounting cavity in a first electrical device with one open end" must be construed as meaning merely apparatus suitable for carrying out the process of mounting, i.e. "An electrical terminal suitable for mounting in a mounting cavity in a first electrical device with one open end".

**2.2** The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 as interpreted above is not new in the sense of Article 33(2)

PCT.

Document **D1** discloses (the references in parentheses applying to this document, see in particular Fig. 3 and related description page 3, paragraphs 47 to 59):

An electrical terminal (Fig. 3: 27) which is suitable to be mounted in a mounting cavity in a first electrical device (Fig. 2: combination of socket 21 and printed circuit board P) with one open end (Fig. 3: upper open end of through hole 25a in upper side plate 25). The terminal of **D1** comprises: a first contact member (Fig. 3: 29) having an outer pressure contacting end portion (29c) of a given diameter for pressure engaging a first electrical device (P) and an inner end portion (29a) of a diameter at least slightly larger than said given diameter; a second contact member (28) having a front pressure contacting end (28d) for pressure engaging a second electrical device (22), a rear end (28c) having a cylindrical hole (28a) for reciprocally receiving the inner end portion (29a) of the first contact member (29), and a restricted stop (see inwardly bent wall of contact member 28) at the rear end of the cylindrical hole for abutting the inner end portion (29a) of the first contact member (29) to define an outer limit position of the first contact member.

The second contact member of **D1** further has an outwardly projecting bearing flange (Fig. 3: 28c) for reciprocally engaging a bearing surface (Fig. 3: 25a) on the first electrical device (Fig. 3: 23). Further, the terminal of **D1** comprises a biasing member (30) in said cylindrical hole in the second contact member (28) and which is engageable with the inner end portion of the first contact member for resiliently biasing the first and second contact members in opposite directions.

The following features of present claim 1 relate to the particular way of mounting the terminal in the mounting cavity of the first electrical device. In particular, also according to **D1** the first electrical device (Fig. 1: 21, P) includes a housing (23) having a mounting cavity (Fig. 3: 25a) with a fixed contact at a base of the cavity (see page 3, para. 50) opposite the open end (Fig. 3: top opening of through hole 25a), the rear end of the second contact member (28) being reciprocally mounted in the cavity with said bearing ring slidably engageable with inner walls of the cavity (see Fig. 3: inner walls of through hole 25a), the pressure contacting end portion of the first contact member being (29) biased into engagement with the fixed contact at the base of the cavity, the pressure contacting end of the second contact member

projecting from the housing (see Fig. 3 and page 3, para. 54 and 55), and the cavity has a restricted stop (Fig. 3: 25b) at an open end thereof for abutting the bearing ring (28c) to define an outer limit position of the second contact member projecting from the housing (see also page 3, para. 52).

In present claim 1, the particular shape of the mounting cavity as being "an **enclosed** cavity" does not form part of the subject-matter of the invention according to claim 1 and therefore cannot distinguish the electrical terminal of present claim 1 vis-à-vis the electrical terminal as disclosed in **D1**.

- 2.2 The subject-matter of claim 1 as interpreted above is also not new in the sense of Article 33(2) PCT in view of document **D2** which discloses in Fig. 1 a three-part electrical terminal suitable to be mounted in a mounting cavity of a first electrical device (see Fig. 1 and 11: cavity 26) and having two contact members (20 and 24) and an intermediate spring (22). A first contact member (24) is reciprocally received in a tube portion of a second contact member (20) and maintained therein by cooperating shoulders (see Fig. 1). The spring is arranged between the inner end of the first contact member and a bottom of the second contact member.

The second contact member of **D2** further has an outwardly projecting bearing flange (Fig. 1: outside wall portions of tube portion of second contact member) for reciprocally engaging a bearing surface (Fig. 1: 26a) on the first electrical device (Fig. 11: combination of socket body 50, circuit board 54, and retainer plate 58).

The mounting cavity shown in Fig. 11 of **D2** is an enclosed cavity, which has a fixed contact at its base opposite to an open end (see Fig. 1 and 11: top opening of cavity 26).

In present claim 1, the particular orientation of mounting the terminal with its first and second pressure ends in the mounting cavity is recited. This feature, however, does not form part of the subject-matter of the invention according to claim 1 and therefore cannot distinguish the electrical terminal of present claim 1 vis-à-vis the electrical terminal as disclosed in **D2**.

- 2.3 Document **D3** discloses in Fig. 1 (first and second contact members 6b and 6a and spring 6c) also the subject-matter of claim 1 which is therefore also not new in the sense of Article 33(2) PCT vis-à-vis **D3**. Also the terminal of **D3** is suitable to be mounted in an enclosed mounting cavity of a first electrical device as presently recited in claim 1. Although **D3** does not show the particular constitution of the mounting cavity of present claim 1 or the particular way of mounting the terminal therein, the shape of the mounting cavity does not form part of the subject-matter of the invention according to claim 1 and therefore cannot distinguish the electrical terminal of present claim 1 vis-à-vis the electrical terminal as disclosed in **D3**.
- 2.4 With respect to novelty of claim 1, it is further pointed out that, although not forming part of the invention of present claim 1, an enclosed mounting cavity with the particular features recited in claim 1 is shown in **D4** (see in particular Fig. 6 and 7 and related description, col. 3, para 10 to 12). In particular, **D4** discloses a first electrical device (Fig. 1: test socket 1 mounted on circuit board 2) having a housing with an enclosed mounting cavity (Fig. 1: bore 19 and upper side of circuit board 12), the mounting cavity having a fixed contact at a base of the cavity (contact pad on upper side of circuit board 12) opposite an open end (see Fig. 6 and 7: top opening of bore 19).

**D4** further discloses an electrical terminal (see **D4**, Fig. 4 and 5: probe 4) similar to the one shown in **D1** with the only difference that the first contact member (**D4**, Fig. 5: 42) is not described as being held in the hole of the second contact member (**D4**, Fig. 4: 31) by means of a slightly enlarged inner end portion on the first contact member and a restricted stop at the rear end of the hole of the second contact member so as to define an outer limit position of the first contact member received in the second contact member.

The electrical terminal of **D4** is arranged in the enclosed cavity of the first electrical device such that the pressure contacting end portion of the first contact member (Fig. 5: 46) is biased into engagement with the fixed contact on the surface of the circuit board (Fig. 6, 7: 2), and the pressure contacting end of the second contact member (Fig. 4: 36) is projecting from the housing. The cavity (**D4**, Fig. 1, 6, and 7: 19) has a restricted stop (top shoulder of bore 19 in Fig. 6, 7) at its open end for abutting the

bearing flange (Fig. 5: contact section 51) to define an outer limit position of the second contact member projecting from the housing.

Each of the terminals of **D1** to **D3** is suitable to be mounted in this particular way in an enclosed mounting cavity as disclosed in **D4**.

It follows that even when interpreting the subject-matter of claim 1 as encompassing the first electrical device having the particular shaped mounting cavity with the corresponding way of arranging the electrical terminal in the mounting cavity, the such interpreted subject-matter does not involve an inventive step in the sense of Article 33(3) PCT. In particular, such subject-matter is obvious in view of **D1** combined with **D4**, or **D2** combined with **D4**, or **D3** combined with **D4**, or eventually **D4** combined with any of **D1** to **D3**.

### **3. INDEPENDENT CLAIM 11**

Claim 11 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claim seeks to define the invention by reference to features of the use to which the apparatus or product is to be put. This is particularly the case as claim 11 not only defines the product itself, i.e. "an electrical terminal", but also specifies its relationship to a second product, i.e. "a first electrical device having an enclosed mounting cavity with one open end" which is not part of the claimed invention. Such a claim must either set forth a clear definition of the individual product being claimed by wording the claims appropriately, or be directed to a combination of the first and second products.

Thus, the subject-matter of present claim 11 commencing with the wording "An electrical terminal for mounting in an enclosed mounting cavity in a first electrical device with one open end" must be construed as meaning merely apparatus suitable for carrying out the process of mounting, i.e. "An electrical terminal suitable for mounting in a mounting cavity in a first electrical device with one open end".

**3.1** The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 11 as interpreted above is not new in the sense of Art. 33(2)



PCT. Claim 11 recites in addition to the features of claim 1 the particular shape of the pressure contacting end portions, the particular biasing member, and the preferred shapes of the contact members. These features are also shown in document **D1** which discloses (the references in parentheses applying to this document, see Fig. 3 in combination with Fig. 6A):

the outer pressure contacting end portion (Fig. 3: 29c) of said first contact member (29) being dome shaped to present a rounded convex contact surface for engaging the first electrical device (Fig. 1: 21, P);

the outer pressure contacting end (Fig. 3 and 6A: 28d) of said second contact member (28) being dome shaped to present a rounded convex contact surface for engaging the second electrical device (Fig. 1: 22);

said inner end portion of the first contact member and said hole in the second contact member being circular in cross-section (see Fig. 3 and 4);

said biasing member being a coil spring (Fig. 3: 30) having one end engageable with the inner end portion of the first contact member and an opposite end engageable with a bottom of the hole (see Fig. 3).

3.2 Further, the subject-matter of claim 11 as interpreted above is also not new in the sense of Article 33(2) PCT in view of document **D2** which discloses in Fig. 1 the dome shaped pressure contacting ends of both contact members (20, 24) and a spring (22) which is interposed between the inner end of the first contact member (24) and the bottom of the hole in the second contact member (20). The circular cross section of the contact members as a whole is also evident from **D2**.

3.3 In case the subject-matter of claim 11 is interpreted differently as encompassing the first electrical device having the particular shaped mounting cavity with the corresponding way of arranging the electrical terminal in the mounting cavity, the such interpreted subject-matter does not involve an inventive step in the sense of Article 33(3) PCT for the corresponding reasons as set out with reference to the subject-matter of claim 1 (see item 2.4 above). In particular, such subject-matter is obvious in view of **D1** combined with **D4**, or **D2** combined with **D4**, or eventually **D4** combined with one of **D1** or **D2**.

#### 4. DEPENDENT CLAIMS 2-6,8,9,13,14

Dependent claims 2-6, 8, 9 and 13 and 14 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

- 4.1 The subject matter of claim 11 results from a combination of the features of claim 1 and dependent claims 2 to 6. Consequently, the subject matter of dependent claims 2 to 6 is not new or at least not inventive in view of either one of **D1** and **D2** for the reasons set forth under items 3.1, 3.2, and 3.3 above.
- 4.2 The features of claims 8 and 9 and 13 and 14 relate to the provision of a ring as a bearing flange on the second contact member for engaging a bearing surface on the first electrical device. Such a bearing flange provided as a projecting peripheral bearing ring near the rear end of the second contact member is also shown in document **D1**, see in particular Fig. 3 and 4: annular projection 28c. Therefore, the subject matter of claims 8, 9, 13 and 14 is not new or at least does not involve an inventive step.

**Re Item VII.**

1. Independent claims 1 and 11 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document **D1** or **D2**) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

For the features known in combination from the prior art it is referred to section "**Re Item V.**", items 2 and 3.

2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents **D1** to **D4** is not mentioned in the description, nor are these documents identified therein.
3. The description is not in conformity with the claims as required by Rule 5.1(a)(iii)

PCT.

**Re Item VIII.**

1. Apart from the objection with reference to the unclear scope of the inventions of claims 1 and 11 set out above in section "**Re item V.**" in connection with the interpretation of the claims, claim 1 is not clear in the sense of Art. 6 PCT for the additional following reasons:
  - the term "the bearing ring" as used in claim 1 has no antecedent in claim 1.
2. Dependent claim 13 refers to the deleted claim 12.
3. The vague statement in the description on page 6, last paragraph implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.

CLAIMS

1. An electrical terminal (30), for mounting in a mounting cavity (54) in a first electrical device (50) with one open end (57) comprising:

a first contact member (32) having an outer pressure contacting end portion (32a) of a given diameter for pressure engaging a first electrical device (50) and an inner end portion (32b) of a diameter at least slightly larger than said given diameter;

a second contact member (34) having a front pressure contacting end (34a) for pressure engaging a second electrical device (62), a rear end (34b) having a hole (38) for reciprocally receiving the inner end portion of the first contact member, a restricted stop (44) at the rear end of the hole for abutting the inner end portion of the first contact member to define an outer limit position of the first contact member, an outwardly projecting bearing flange (42) for reciprocally engaging a bearing surface (54a) on the first electrical device (50);

a biasing member (36) in said hole in the second contact member and engageable with the inner end portion of the first contact member for resiliently biasing the first and second contact members in opposite directions; and

the first electrical device (50) having a housing (52) with the enclosed mounting cavity (54), the mounting cavity with a fixed contact (56) at a base (54b) of the cavity opposite said open end (57), the rear end (34b) of the second contact member (34) being reciprocally mounted in the cavity with said bearing ring (42) slidably engageable with inner walls (54a) of the cavity, the pressure contacting end portion (32a) of the first contact member (32) being biased into engagement with the fixed contact at the base of the cavity, the pressure contacting end (34a) of the second contact member (34) projecting from the housing, and the cavity has a restricted stop (58) at an open end (57) thereof for abutting the bearing ring to define an outer limit position of the second contact member projecting from the housing.

2. The electrical terminal of claim 1 wherein the outer pressure contacting end portion (32a) of said first contact member (32) is dome shaped to present a

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rounded convex contact surface (46) for engaging the first electrical device (50).

3. The electrical terminal of claim 1 wherein the outer pressure contacting end (34a) of said second contact member (34) is dome shaped to present a rounded convex contact surface (48) for engaging the second electrical device (62).

4. The electrical terminal of claim 3 wherein the outer pressure contacting end portion (32a) of said first contact member (32) is dome shaped to present a rounded convex contact surface (46) for engaging the first electrical device (50).

5. The electrical terminal of claim 1 wherein said biasing member comprises a coil spring (36) having one end engageable with the inner end portion (32b) of the first contact member (32) and an opposite end engageable with a bottom (38a) of the hole (38).

6. The electrical terminal of claim 1 wherein said inner end portion (32b) of the first contact member (32) and said hole (38) in the second contact member (34) are circular in cross-section.

8. The electrical terminal of claim 1 wherein said bearing flange comprises a peripheral bearing ring (42) about the second contact member (34).

9. The electrical terminal of claim 8 wherein said bearing ring (42) is located near the rear end (34b) of the second contact member (34).

11. An electrical terminal (30) for mounting in an enclosed mounting cavity (54) in a first electrical device (50) with one open end (57), comprising:

a first contact member (32) having an outer pressure contacting end portion (32a) of a given diameter for pressure engaging a first electrical device (50) and an inner end portion (32b) of a diameter at least slightly larger than said given diameter, the outer pressure contacting end portion being dome shaped to present a rounded convex contact surface (46) for engaging the first electrical device;

a second contact member (34) having a front pressure contacting end (34a) for pressure engaging a second electrical device (62), a rear end (34b) having a hole (38) for reciprocally receiving the inner end portion of the first contact member, and a restricted stop (44) at the rear end of the hole for abutting the inner end portion of the first contact member to define an outer limit position of the first contact member, the outer pressure contacting end being dome shaped to present a rounded convex contact surface (48) for engaging the second electrical device;

said inner end portion (32b) of the first contact member (32) and said hole (38) in the second contact member (34) being circular in cross-section;

a coil spring (36) in said hole (38) in the second contact member and engageable with the inner end portion of the first contact member for resiliently biasing the first and second contact members in opposite directions; and

said first electrical device (50) including a housing (52) having the enclosed mounting cavity (54) with a fixed contact (56) at a base (54b) of the cavity opposite the open end (57), the rear end (34b) of the second contact member (34) being reciprocally mounted in the cavity with a bearing flange (42) slidably engageable with inner walls (54a) of the cavity, the pressure contacting end portion (32a) of the first contact member (32) being biased into engagement with the fixed contact at the base of the cavity, the pressure contacting end (34a) of the second contact member (34) projecting from the housing, and the cavity has a restricted stop (58) at an open end (57) thereof for abutting the bearing flange to define an outer limit position of the second contact member projecting from the housing.

13. The electrical terminal of claim 12 wherein said bearing flange comprises a peripheral bearing ring (42) about the second contact member (34).

14. The electrical terminal of claim 13 wherein said bearing ring (42) is located near the rear end (34b) of the second contact member (34).

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